

Appl. No. 09/829,797

REMARKS

This is in response to the Office Action of 23 September 2004. Claims 1-7 and 12-14 are pending in the application, and Claims 1-7 and 12-14 have been rejected.

By this Response, arguments are presented traversing the rejections.

No new matter has been added.

In view of the remarks below, Applicants respectfully request reconsideration and further examination.

About The Invention

The present invention relates generally to structures suitable for use in integrated circuits and which reduce, or eliminate, cracking in the area of bonding pads. More particularly, the present invention relates to structures which underlie bonding pads, and form isolated areas of dielectric material such that those isolated areas filled with dielectric material have a surface to volume ratio where an amount of elastic energy to be released when a crack is formed in the dielectric material is smaller than an amount of surface energy to be gained when the crack is formed.

Rejections under 35 USC §103(a)

Claims 1 and 3-5 have been rejected under 35 USC §103(a) as being unpatentable over Ker, et al., (US Patent 6,633,087) in view of Lee, et al., (US Patent 6,465,337).

Claims 2 and 7 have been rejected under 35 USC §103(a) as being unpatentable over Ker, et al., in view of Lee, et al., and Kida, et al., (US Patent 6,313,540).

Claim 6 has been rejected under 35 USC §103(a) as being unpatentable over Ker, et al., in view of Lee, et al., and Saran, et al., (US Publication No. 2002/0187634).

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Claims 12 and 14 have been rejected under 35 USC §103(a) as being unpatentable over Ker, et al., in view of Lee, et al., and Haluska, et al., (US Patent 4,847,162).

Applicants respectfully traverse the rejections under 35 USC §103(a), and request that these rejections be withdrawn. As described in greater detail below, Applicants respectfully assert that the combination of Ker, et al., with Lee, et al., does not teach, suggest, or provide motivation for the invention defined by Applicants' independent Claim 1.

With respect to independent Claim 1, the Examiner states that Ker, et al., fail to disclose the recited limitation of the isolated areas filled with dielectric material having a surface to volume ratio such that an amount of elastic energy to be released when a crack is formed in the dielectric material is smaller than an amount of surface energy to be gained when the crack is formed. The Examiner further states that Lee, et al., disclose insulators that are between 0.3 μ m and 10 μ m in width, and reasons that this would make Applicants' claimed invention obvious because in one of Applicant's examples it is stated that "when the dielectric thickness is 1 μ m, the width and length should be smaller than 10 μ m".

For at least the reasons set forth below, Applicants respectfully assert that this reasoning is in error.

Firstly, Applicants' claim language specifically recites that the dielectric material has a surface to volume ratio such that an amount of elastic energy to be released when a crack is formed in the dielectric material is smaller than an amount of surface energy to be gained when the crack is formed. Lee, et al., provide no disclosure of the elastic energy or the surface energy as the factors upon which the physical dimensions of the dielectric material are based.

Secondly, Lee, et al., are concerned only with lateral dimensions and not with volume; and clearly not with the surface to volume ratio recited in Claim 1. This can be seen in the fact the Lee, et al., do not disclose any thickness

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dimension for the dielectric material. Clearly, if Lee, et al., in any way taught, suggested, or provided motivation for the Claimed invention, they would have used words such as "volume", and provided parameters such as dielectric thickness. Since Lee, et al., provide no such disclosure, this reference can not make up for the deficiencies of the disclosure by Ker, et al.

Thirdly, the Examiner has mischaracterized the disclosure of Lee, et al., with respect to the lateral dimensions of the dielectric material as having a width between 0.3 μ m and 10 μ m. Lee, et al., state only that an interval between "island insulators" is between 0.3 μ m and 10 μ m (col. 5, lines 55-57). The interval between islands appears to be the stepping distance between units rather than the specification of the width and length of the dielectric blocks. Again, there is no disclosure of thickness, volume, volume to surface ratio, elastic energy, or surface energy in Lee, et al.

Applicants respectfully submit that the cited combination of references can not be said to disclose, suggest, or motivate Applicants' claimed invention, and therefore the rejection of Claim 1 is improper. In view of the foregoing, Applicants respectfully request that the rejection of Claim 1 be withdrawn.

Claims 2-7 and 12-14 all depend, directly or indirectly, from independent Claim 1. As Applicants have noted above, the limitations of Claim 1 are not met by the combination of the cited references. In view of the foregoing, Applicants respectfully submit that the rejections of Claims 2-7 and 12-14 should also be withdrawn.

Conclusion

All of the rejections in the outstanding Office Action of 23 September 2004 have been responded to, and Applicants respectfully submit that the pending Claims 1-7 and 12-14 are now in condition for allowance.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

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Respectfully submitted,

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